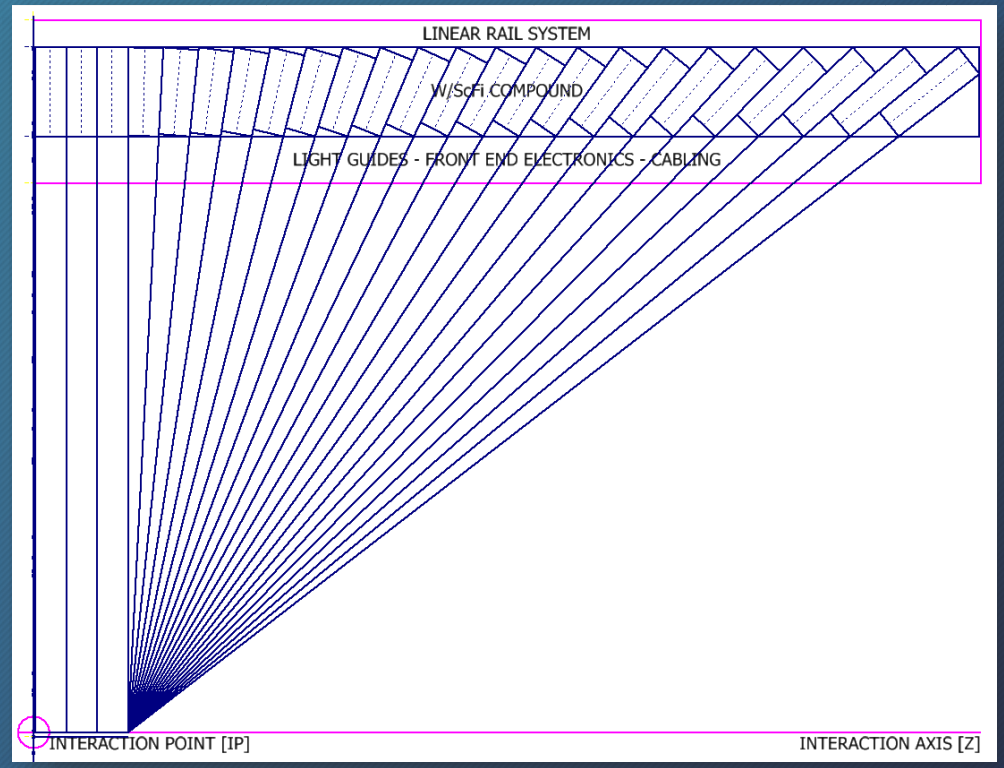
EMCal Block, Screen and Light Guide Design

Dan Cacace

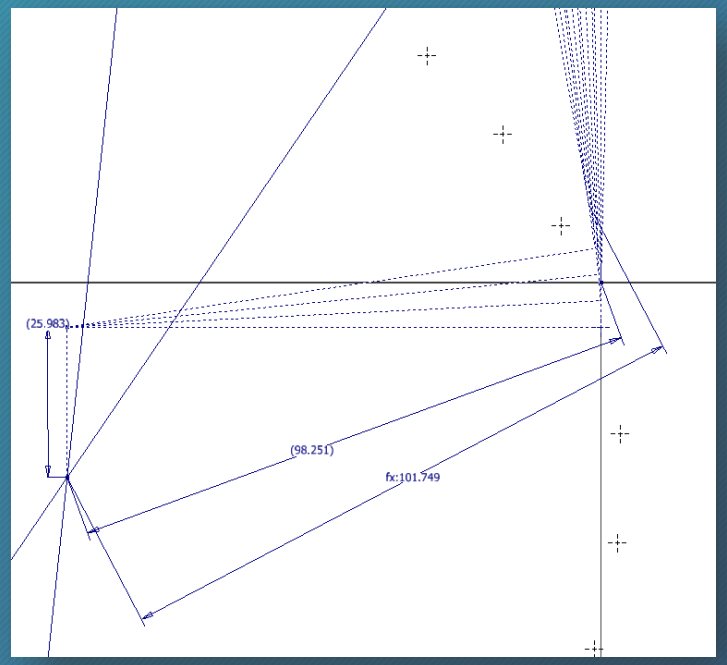
EMCal Block Design

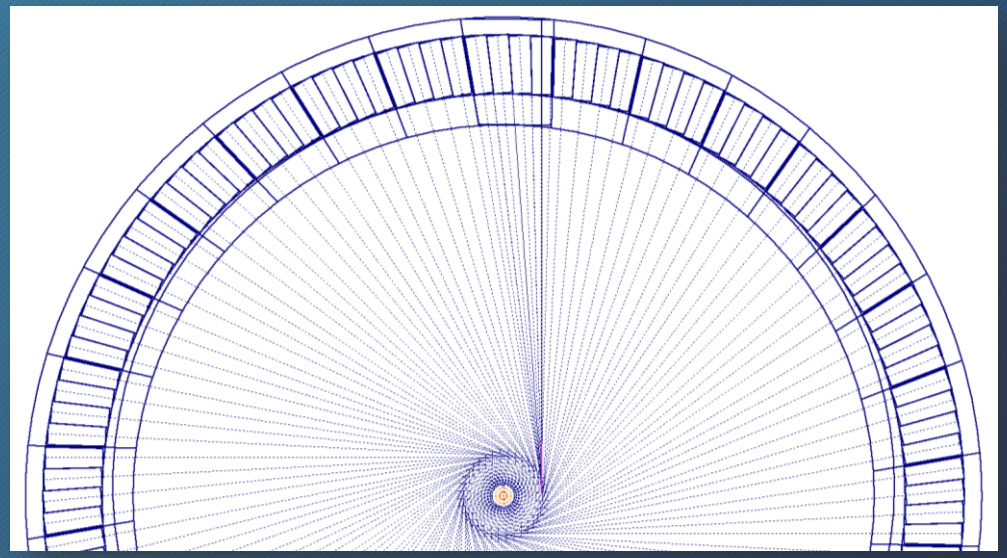
- First three blocks 1D projected. (As per Jin's request.)
- 22 different blocks.
- Blocks 4-24 blocks focus ~150 mm away from "center point" along the "central axis".



EMCal Block Design

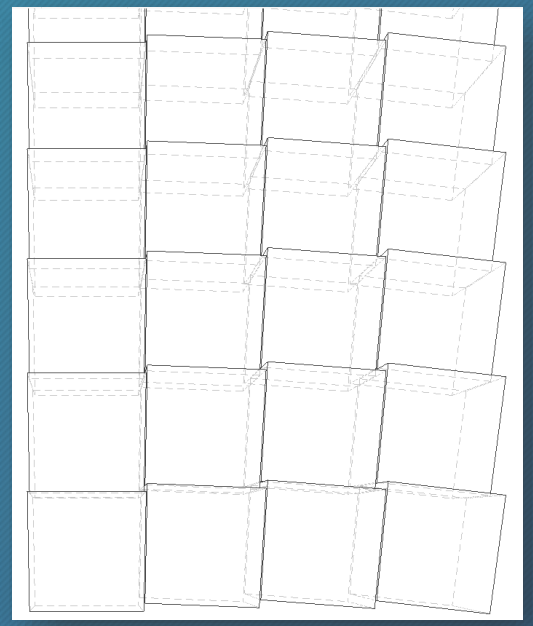
- Tilt blocks such that the focal point is ~100 mm radially from central axis.

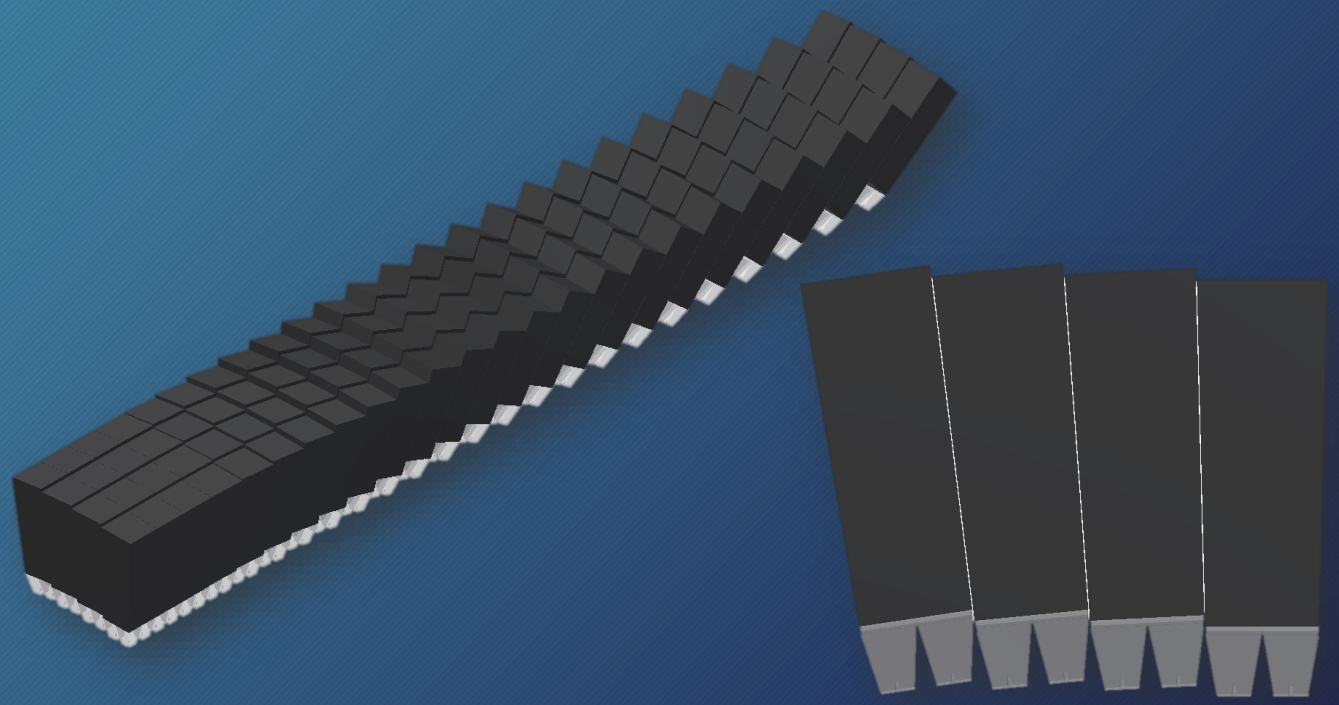




EMCal Blocks

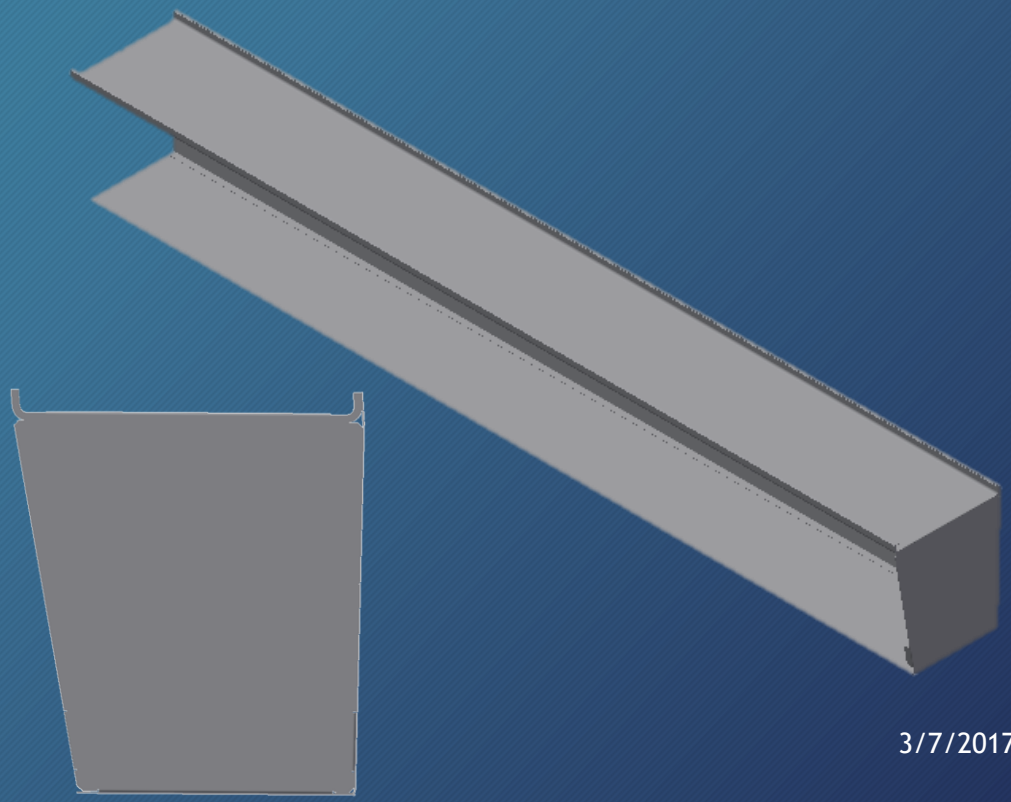
- No additional taper.
- Creates another saw tooth pattern within a modal.
- 22 Blocks.





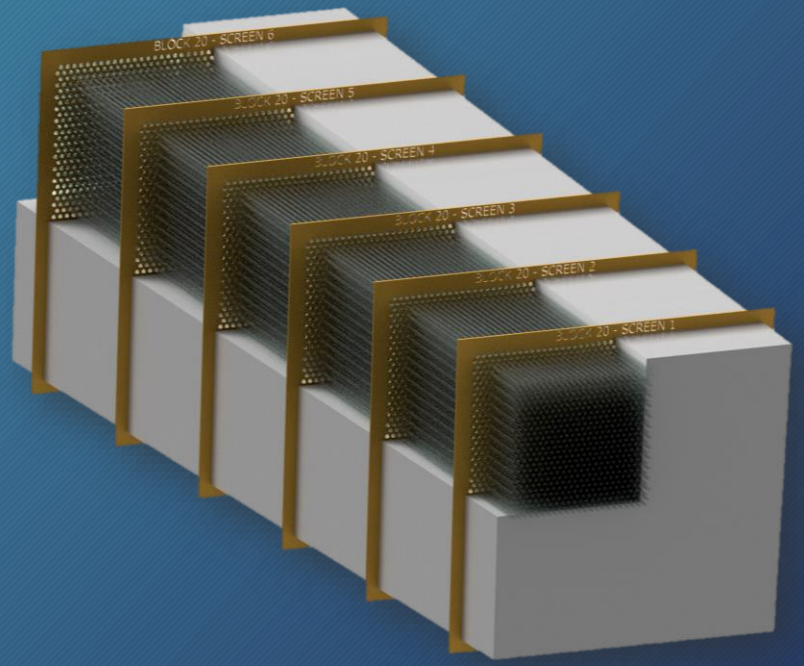
EMCal Sheet Metal Box

- 2 different (mirrored) sheet metal boxes needed:
- 2 Different Side Plates
- 2 Different Font/Back Plates
- 2 Different Strong backs
- 1 Bottom Plate
- 1 Mid Plate
- Previously only one of each type was needed.



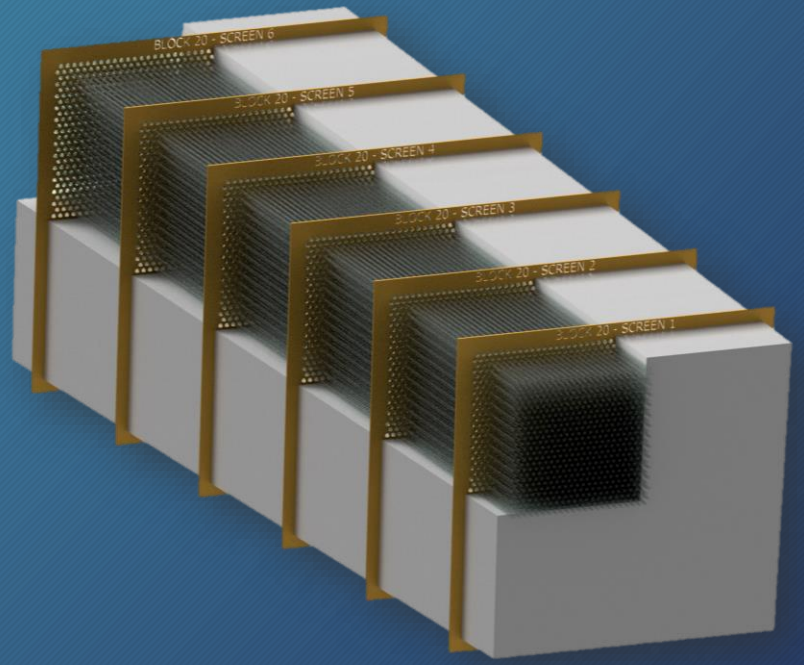
EMCal Block Screens

- All blocks have the same number of fibers. (The 1D projected blocks have a higher fiber density. The code I created wants to use one less row of fibers for the 1D blocks.)
- How many fibers do we want per block? (Currently ~2800 fibers, but it's a tradeoff for overall density.)



EMCal Block Fibers

- IdP – Ideal Pitch
- Gap – Screen material between closest holes with worst case tolerance.
- 47*56 = 2632 Fibers, IdP = 0.9776905, Gap = 0.1073
- 48*56 = 2688 Fibers, IdP = 0.9673445, Gap = 0.0871
- 48*58 = 2784 Fibers, IdP = 0.950925, Gap = 0.0815
- 49*58 = 2842 Fibers, IdP = 0.9403778, Gap = 0.0677
- 50*60 = 3000 Fibers, IdP = 0.9149205, Gap = 0.0482



EMCal Block Light Guides

- Has there been a decision on the shape, length or fiber collar for the light guides?